

01-SM5-313  
(ATI-0016)

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#### REMARKS

Claims 1-3, 5-10, and 12-20 were pending in the present Application. Claims 1, 3, 5, 10, 12, 13, and 17 have been amended, leaving Claims 1-3, 5-10, and 12-20 for further consideration in the present amendment. Support for the amendments to Claims 1 and 17 that add the feature of a wavelength range of about 150nm to about 500nm can be found in original Claim 9 and as such does not raise any new issues or require a new search.

It is believed that the amendments made herein may be properly entered at this time, i.e., after final rejection, because none the amendments made herein require a new search or raise new issues and reduce issues for appeal.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

#### Claim Rejections Under 35 U.S.C. § 112

A. Claims 3, 5, 10, 12, and 13 stand rejected under 35 USC 112, first paragraph, for failing to comply with the written description requirement. Applicants respectfully traverse.

The rejection has been rendered moot by way of amendment.

B. Claims 1-3, 5-8, 12, and 17-20 stand rejected under 35 USC 112, second paragraph, as being indefinite. Applicants respectfully traverse.

The rejection has been rendered moot by way of amendment.

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Claim Rejections Under 35 U.S.C. § 102

A. Claims 1-3, 5-8, and 17-20 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Patent No. 6,281,135 to Han et al. (hereinafter "Han"). Applicants respectfully traverse.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Barient Inc.*, 827 F.2d 744, 747, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

It is respectfully submitted that Han fails to disclose any drying process for removing contaminants from a dielectric layer. Rather, Han discloses processes for ashing photoresist and/or removing post etch residues without damaging a low k dielectric material by use of oxygen free plasma. Han is concerned with maintaining relatively high ashing selectivities (i.e., removal of photoresist and/or residues at a much faster rate than removal of low k dielectric material). The oxygen-free plasma taught by Han et al would not result in exposing the low k dielectric layer to photons in an amount effective to cause excitation, scission and/or fragmentation of contaminants contained within the low k dielectric layer as claimed by Applicants. At the wafer level, the oxygen-free plasma described by Han et al provides very little UV light (<400nm). This is clearly shown and supported by Figure 5 of U.S. Patent No. 6,492,186 (the Continuation-in-Part application of Han et al.), which graphically illustrates a 3-dimensional view showing the time evolution of light intensity emitted from 200 nm to 600 nm during an oxygen plasma process. The peak at 388nm is due to an emission signal related to CN, which is produced as a byproduct of the reaction during the ashing of photoresist – not due to the oxygen-free plasma alone. Once the photoresist is completely removed, i.e., ashed (as shown in Figure 5 when Time >155 seconds), the emission spectrum below 500 nm from the oxygen-free plasma is minimal or non-existent. Even if there is a minimal amount of photons present, it is unlikely that it would be in an amount effective to cause excitation, scission and/or fragmentation of contaminants that are contained within the low k dielectric layer as claimed by Applicants.

It is also submitted that the disclosure provided by Han would not inherently anticipate all of the features found in Applicants claims. In order to support an anticipation rejection based on

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inherency, the Office Action must provide factual and technical grounds establishing that the inherent feature necessarily flows from the teachings of the prior art. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Int. 1990); *In re Oelrich*, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981) (holding that inherency must flow as a necessary conclusion from the prior art, not simply a possible one). Han is directed to ashing photoresist from substrates that include low k dielectric materials. There is no basis in fact and/or technical reasoning to reasonably support the determination that Applicants' claimed drying process *necessarily* flows from the teachings of Han since there is no disclosure in Han of any drying process that occurs or of any process that includes exposing the substrate containing the low k dielectric layer to photons having wavelengths from about 150 nm to about 500 nm in an amount effective to cause excitation, scission and/or fragmentation of contaminants contained within the low k dielectric layer as claimed by Applicants.

Accordingly, the rejections of Claims 1-3, 5-8, and 17-20 should be withdrawn since Han fails to disclose all claim elements as is required to maintain a proper 102 rejection.

B. Claims 9, 10, 12-16 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by Han as evidenced by U.S. Patent No. 6,495,825 to Chace (hereinafter "Chace"). Applicants respectfully traverse these rejections.

For reasons previously discussed above, Han fails to anticipate a drying process. The evidence provided by Chace fails to compensate for the deficiencies of Han. That is, neither reference discloses a drying process that includes, *inter alia*, exposing the low k dielectric layer in the process chamber to the radiation comprising a wavelength of about 150 nanometers to about 500 nanometers as claimed by Applicants.

For similar reasons related to the teachings of Han above, Chace would also fail to produce any significant amount of UV light at the wafer level. In Chace, the type of UV source referred to in the Office Action is a hydrogen discharge lamp. An exemplary spectrum of such a lamp is provided in Fig. 3 of U.S. Patent No. 5,543,687, filed concurrently herewith in a supplemental IDS. As shown, the UV emission of interest herein (predominantly the Lyman- $\alpha$  line) is substantially different from that claimed by applicants.

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Accordingly, the rejection should be withdrawn.

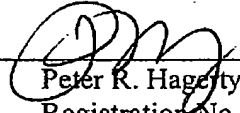
It is believed that the foregoing amendments and remarks fully comply with the Final Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and allowance are requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130 maintained by Applicants' attorneys.

Respectfully submitted,

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